

TITLE

INTERNET INTERFACE SERVICE SYSTEM AND METHOD

CLAIM OF PRIORITY

[0001] This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. §119 from my application *AN INTERNET CONNECTION SERVICE SYSTEM AND THE METHOD THEREOF* filed with the Korean Industrial Property Office on 15 September 2000 and there duly assigned Serial No. 54280/2000.

BACKGROUND OF THE INVENTION

Technical Field

[0002] The present invention relates to an internet interface service system and method enabling a user to be provided with high-speed internet connection services by connecting to the internet interface service system, the system and method providing high-speed connection service and executing charges through the use of a portable computer which the user carries with himself in public places.

Prior Art

[0003] In general, the development of internet communications provides a communication environment in which a user who hopes to connect to the internet network can be connected to

1 the internet anywhere through a mobile phone, a leased-line connection service provider, or the
2 like by using a mobile terminal of the user. Accordingly, the user can connect to the internet
3 network and conduct his own business in any place where lines for internet connections are
4 provided (e.g., on business trips, travel, academic conference participation, or the like) by using
5 his own mobile terminal, such as a notebook computer, a palm-top computer, a small-sized
6 network computer, a PDA, or the like. However, there exists an inconvenience in that, in order
7 for a user who has a portable mobile terminal to connect the internet, the user has to connect his
8 portable terminal to a telephone line or a leased-line furnished in his abode, or has to visit a
9 particular place which provides an internet connection service.

10 [0004] Further, a user can be provided with internet service supplied through an internet
11 service provider (ISP), that is, by use of a general modem connecting his mobile phone or
12 personal communication system (PCS) phone to a portable mobile terminal. However, this
13 causes a problem in that the user must incur expense in order to be provided with the internet
14 service, and the expense can be high since the mobile phone fee is so expensive.

15 [0005] Finally, if the user does not have his portable terminal equipped with internet
16 communication support facilities, such as a local area network (LAN) card, a modem, or the like,
17 there exists another problem in that the user cannot connect to the internet at all.

18 SUMMARY OF THE INVENTION

19 [0006] Accordingly, in order to solve the above problems, it is an object of the present

1 invention to provide an internet interface service system and method enabling a user who carries
2 a portable mobile terminal with him to connect to the internet and to conduct his business by
3 using his portable mobile terminal in a public place, such as an airport, a conference room, a bus
4 terminal, and so on.

5 [0007] In order to achieve the above object, the internet interface service system and method
6 provide for establishment of a booth in a public place, and provision of an interface unit for
7 making a connection to the internet by using a mobile terminal of a user when he is in the booth,
8 high-speed leased lines for connecting the interface unit to the internet network, a central
9 management server for allocating a dynamic internet provider (IP) address to the user's mobile
10 terminal when connected to the interface unit, and a settlement server for recording or making
11 charges with respect to the internet interface service using the mobile terminal.

12 [0008] The mobile terminal may be a notebook computer, a palm top computer, a network
13 computer, a PDA, or the like.

14 [0009] The interface unit comprises: a connection terminal or a connection unit, such as a
15 LAN cable to which the mobile terminal is to be connected, or a LAN cable to which a LAN card
16 is connected; a communication unit enabling the user to connect to the internet network through
17 his mobile terminal; a settlement unit for charging the user for services based on a charging rate
18 according to a predetermined reference; an output unit for outputting a receipt according to the
19 charging function performed in the settlement unit, and for displaying a message; a storage unit
20 for storing usage information as to the user, and predetermined operating programs for

1 controlling the entire interface unit; and a control unit for controlling the above components
2 according to the operating programs stored in the storage unit.

3 BRIEF DESCRIPTION OF THE DRAWINGS

4 [0010] A more complete appreciation of the invention, and many of the attendant advantages
5 thereof, will be readily apparent as the same becomes better understood by reference to the
6 following detailed description when considered in conjunction with the accompanying drawings
7 in which like reference symbols indicate the same or similar components, and wherein:

8 [0011] FIG. 1 is a block diagram of an internet interface system according to an embodiment
9 of the present invention;

10 [0012] FIG. 2 is a block diagram showing the internal construction of the interface unit of FIG.
11 1;

12 [0013] FIG. 3 is a flow chart of the process carried out by the internet interface service system
13 according to an embodiment of the present invention;

14 [0014] FIG. 4 is a subroutine for connection to the internet as executed in the flow chart of
15 FIG. 3;

16 [0015] FIG. 5 is a subroutine for an authentication process as executed in the flow chart of
17 FIG. 3; and

18 [0016] FIG. 6 is a subroutine for a communication termination and charge process as executed
19 in the flow chart of FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0017] Hereinafter, the present invention will be described in detail through the attached drawings indicating an embodiment thereof.

[0018] FIG. 1 is a block diagram of an internet interface service system according to an embodiment of the present invention.

[0019] As shown in FIG. 1, the internet interface service system includes: an internet network 5 designed for provision of high-speed internet connection service; plural interface units 1 (only one is shown for the sake of simplicity) connected to plural mobile terminals 10 (again, only one is shown) so as to connect the mobile terminals 10 to the internet network 5 and to provide them with internet services; information providing servers 4 for providing information to the mobile terminals 10 via interface network 5 and interface units 1; and a central management server 2 for carrying out authentications of the mobile terminals 10 by performing data communications with a settlement server 3, for allocating dynamic IP addresses so that the mobile terminals 10 can execute internet searches, for releasing the dynamic IP addresses allocated to the mobile terminals 10 as the mobile terminals 10 receive internet connection termination signals from the interface units 1, for transmitting charge information with respect to the internet connection services to the settlement server 3, and for remotely managing the plural interface units 1. The settlement server 3 is an external settlement server for transacting the settlement functions in accordance with the reception of settlement information from the interface units 1 as users of the mobile terminals 10, connected to the interface units 1, input the settlement information to the

1 interface units 1 by using settlement media for the internet connection services, that is,
2 predetermined settlement cards, such as credit cards, IC cards, rechargeable cards, or the like.

3 **[0020]** The operations of the internet interface service system according to an embodiment of
4 the present invention will be described in detail with reference to FIG. 2 and FIG. 3.

5 **[0021]** FIG. 2 is a block diagram showing the internal construction of the interface unit of FIG.
6 1.

7 **[0022]** As shown in FIG. 2, the interface unit 1 includes a first communication unit 22
8 connected to the mobile terminal 10 of the user in order for the mobile terminal 10 to be
9 connected to the internet network 5; a second communication unit 23 for connecting the interface
10 unit 1 to a communication unit (not shown) in network 5; a storage unit 24 for temporarily
11 storing and managing charge information with respect to the use of the interface unit 1, and a
12 driver for storing operating programs of the interface unit 1 and for activating a network
13 communication unit (not shown) mounted in the mobile terminal 10 of the user; a settlement unit
14 25 for inputting settlement information relative to the user from a settlement unit (not shown) in
15 mobile terminal 10 in order to settle charges for internet connections of the mobile terminal 10; a
16 liquid crystal display (LCD) 27 for displaying usage guidance information, connection
17 information, and usage statement information for a user; an output unit 26 for outputting the
18 usage statement of a user; and a control unit 21 for activating a communication channel with the
19 mobile terminal 10 when the mobile terminal 10 is connected to the first communication unit 22,
20 for transmitting to the settlement server 3 (FIG. 1) information as to a settlement medium of a

1 user inputted from the settlement unit 25, for storing in the storage unit 24 charge information
2 with respect to the connections to the mobile terminal 10, for transmitting the charge information
3 to the central management server 2 and allocating, to the mobile terminal 10, a dynamic IP
4 address allocated and transmitted from the central management server 2 if authorized, for
5 outputting the charge information to the output unit 26 from the storage unit 24 while, at the
6 same time, transmitting credit card information and connection charge information for a user
7 through second communication unit 23 to the settlement server 3 of a credit card company when
8 the settlement medium of the user is a credit card. When the settlement medium of the user is a
9 rechargeable card, control unit 21 deducts the connection service charge from the rechargeable
10 medium, transmits the deducted connection service charge to the central management server 2
11 when the connection of the mobile terminal with the interface unit 1 is terminated, and controls
12 all of the components of the interface unit 1.

13 **[0023]** The second communication unit 23 may be a wireless communication unit capable of
14 carrying out wireless communications without being connected to any external cable.

15 **[0024]** FIG. 3 is a flow chart of the process carried out by the internet interface service system
16 according to an embodiment of the present invention.

17 **[0025]** As shown in FIG. 3, as a mobile terminal 10 of a user is connected to the interface unit
18 1 through a connector, such as a LAN cable of the first communication unit 22 or a LAN cable
19 connected to a LAN card which is provided in the interface unit 1, a communication unit (not
20 shown) in the mobile terminal 10 is activated, and the control unit 21 in the interface unit 1

1 detects the activation, so that the internet interface service system activates a particular
2 communication channel for the mobile terminal 10 of the user through the first communication
3 unit 22, and carries out a communication connection with the mobile terminal 10 (S301).

4 **[0026]** When the communication connection is carried out, the control unit 21 inputs, from the
5 settlement unit 25, card reader information on the settlement media of the user (for example, a
6 credit card, a rechargeable card, an IC card, or the like) in order that charges regarding the use of
7 the interface unit 1 by the user's mobile terminal 10 be settled, transmits the information to the
8 settlement server 3 under control of the central management server 2, enables the central
9 management server 2 to receive, through the interface unit 1 from the settlement server 3, a usage
10 authentication signal with respect to the internet use, and transmits to the interface unit 1 a signal
11 having a dynamic IP address to be allocated for the mobile terminal 10 and the usage
12 authentication signal (S302).

13 **[0027]** In step S302, the interface unit 1 receiving the dynamic IP address data and the usage
14 authentication signal from the central management server 2 allocates the received dynamic IP
15 address to the connected mobile terminal 10 of the user so that the mobile terminal 10 of the user
16 is provided with internet service by using the dynamic IP address allocated from the lines
17 connected by the interface unit 1 and the central management server 2 (S303). When the mobile
18 terminal 10 provided with the internet service through connection to the interface unit 1
19 terminates internet searches or the work being conducted through the internet network by using
20 the interface unit 1, the mobile terminal 10 transmits a predetermined termination signal to the

1 interface unit 1. The predetermined termination signal is, for example, an inactivation of the
2 communication unit of the mobile terminal as in the power-off of the mobile terminal, or a
3 communication channel termination signal automatically transmitted when an external
4 connection is terminated from the mobile terminal 10 of the user, or a shutoff of the internet
5 service provided from the interface unit 1 by selecting a connection termination appearing on a
6 menu of the interface unit 1. When the interface unit 1 receives the connection termination
7 signal, the connection termination signal is transmitted to the control unit 21 of the interface unit
8 1, the control unit 21 receiving the signal closes the communication channel connected with the
9 mobile terminal 10 and indicates, on the liquid crystal display (LCD) 27, charge information
10 stored in the storage unit 24 while at the same time outputting a usage statement through the
11 output unit 26. Further, the charge information and the connection termination signal are
12 transmitted from the interface unit 1 to the central management server 2, and, when the charge
13 information is transmitted to the settlement server 3 in the charging process, the charge
14 information is transmitted to the settlement server 3 through the central management server 2 so
15 that the charges are transacted. Furthermore, the central management server 2, when receiving
16 the connection termination signal from the interface unit 1, releases the setting of the dynamic IP
17 address allocated to the mobile terminal 10 in order that a mobile terminal 10 connected with
18 another interface unit 1 can use the dynamic IP address, and then it terminates the entire process
19 (S304).

20 [0028] FIG. 4 is a subroutine for connection to the internet (S301) from the flow chart of FIG.

3.

[0029] The first communication unit 22 mounted in the interface unit 1 is one of the communication units implemented in the mobile terminal 10 of the user through a LAN cable, and is equipped with the LAN cable to which a LAN card is connected and is to be used if the LAN cable equipped with an RJ45 connector connected to the LAN card and the LAN card as a communication unit of a user's mobile terminal 10 are not provided. When a user connects, to mobile terminal 10, either a LAN cable of the first communication unit 22, provided in the interface unit 1, or a LAN cable to which a LAN card is connected, the control unit 21 of the interface unit 1 activates a communication port connected with the user's mobile terminal 10 (S401). In step S401, when a LAN card is not mounted as a communication medium in the user's mobile terminal 10, the user mounts in the mobile terminal a LAN cable having a LAN card connected to the first communication unit 22 of the interface unit 1. After that, the control unit 21 transmits to the central management server 2 a signal notifying of the activation of the communication port, while at the same time outputting a message requiring insertion of a settlement medium into the liquid crystal display 27 of the interface unit 1 (S403).

[0030] FIG. 5 is a subroutine of an authentication process carried out in the flow chart of FIG.

3.

[0031] As a user inserts a user's settlement medium into the settlement unit 25, the settlement unit 25 reads information on the settlement medium and transmits the read information to the control unit 21. The control unit 21 encrypts the information on the user's settlement medium in

1 accordance with a predetermined reference, and transmits the encrypted information to the
2 settlement server 3 through the central management server 2 (S501, S502).

3 **[0032]** The settlement server 3, receiving the information from the settlement medium,
4 decodes the received information and, when the settlement medium is authorized, server 3
5 transmits to the central management server 2 a signal approving the settlement medium of the
6 user. The central management server 2 receiving the approval signal for the user from the
7 settlement server 3 transmits one of the IP addresses allocatable as a dynamic IP address of the
8 stored IP addresses to the interface unit 1 so as to allocate the dynamic IP address to the mobile
9 terminal 10 of the user connected to the interface unit 1, and so that the mobile terminal 10 of the
10 user can be connected to the internet network (S503). In this step S503, if the settlement medium
11 of the user is not authorized, the central management server 2 outputs an error message, and the
12 communication is terminated.

13 **[0033]** FIG. 6 is a subroutine for the communication termination and charge process function
14 shown in the flow chart of FIG. 3.

15 **[0034]** When the user wishes to terminate work through the interface unit 1 with a mobile
16 terminal 10, forced termination methods are employed in which a communication medium
17 connecting the mobile terminal 10 of the user to the interface unit 1 is forcibly interrupted or the
18 power to the mobile terminal 10 of the user is turned off, or a connection termination menu in the
19 menu outputted on the liquid crystal display 27 of the interface unit 1 is selected for termination.

20 **[0035]** When the control unit 21 of the interface unit 1 receives a connection termination

1 signal (S601), termination information is, in effect, requested (S602), and usage time information
2 and usage fee information for the user is outputted on the liquid crystal display (LCD) 27 of the
3 interface unit 1 by a charge device stored in the storage unit. At the same time, the control unit
4 21 of the interface unit 1 transmits usage time information, usage fee information, and a
5 connection termination signal to the central management server 2. The usage time information
6 and the usage fee information of the user, transmitted from the interface unit 1, are sent to the
7 settlement server 3 to carry out the charge of the usage fee, and the central management server 2
8 releases the allocation of the dynamic IP address allocated to the mobile terminal 10 according to
9 the connection termination signal. Next, the control unit 21 of the interface unit 1 uses the
10 charge device provided in the storage unit 24 to transmit the charge information on the
11 connection time period of mobile terminal 10 to the output unit 26, prints the charge information
12 by means of a printer device or the like, thereby providing a receipt (S603), and then terminates
13 the process.

14 **[0036]** The above stated connection termination signal includes a normal termination signal,
15 an abnormal termination due to a power-off of the user's mobile terminal 10, and a connection
16 termination from a menu displayed on the liquid crystal display 27 of the interface unit 1. In the
17 case of an abnormal termination, the control unit 21 of the interface unit 1 determines the
18 abnormal termination through the detection of a "no signal input" condition from a LAN card.

19 **[0037]** It should be noted that the above-stated internet connection service may be obtained by
20 employing a leased line providing high-speed internet connection services.

1 **[0038]** Schematically describing the above-stated internet interface service system again, as
2 one example, a high-speed leased line is established, a small booth is constructed in a special
3 location in a public place and the high-speed leased line is placed therein, and facilities such as a
4 connection medium, a chair, a desk and the like are supplied in the booth.

5 **[0039]** In addition, from the above-stated configuration, the central management server 2 may
6 have member information contained therein, so that a rechargeable card issued by a business
7 operating the internet interface service system may be used for settlement. In such case, member
8 identity numbers and the amounts of money registered in rechargeable cards or IC cards are
9 stored in the central management server 2 for use in settlement. Further, the central management
10 server 2 can be associated with a settlement server carrying out credit card settlements as a proxy
11 for such credit card settlements.

12 **[0040]** Describing the construction of the central management server 2 in detail with respect to
13 the above-stated internet interface service system, although not shown in the figures, the central
14 management server 2 has a user database, a database for the interface units 1, and a DHCP server
15 which can dynamically allocate IP addresses, the latter being built into the central management
16 server 2 or established in a separate computer to be operatively associated with the central
17 management server 2. Further, plural interface units 1 can be connected to the internet network,
18 and, if a communication medium, a storage medium and a predetermined operating program are
19 installed, a control unit is included to control the entire central management server 2.

20 **[0041]** As stated above, the internet interface service system and method according to the

1 present invention enable users to conduct their work through connections to a communication
2 network (or internet communication network) with the use of their portable mobile terminals in
3 public places, such as airports, conference places and bus terminals where the interface units,
4 according to the present invention, are installed.

5 **[0042]** It should be understood that the present invention is not limited to the particular
6 embodiment disclosed herein as the best mode contemplated for carrying out the present
7 invention, but rather that the present invention is not limited to the specific embodiments
8 described in this specification except as defined in the appended claims.